

REMARKS

In response to the April 19, 2007 Office Action, Applicant cancels claims 2, and 4 through 11, and adds new claims 12 through 18. Applicant submits these new claims to clarify and more distinctly point out the subject matter of the present invention.

The object of the invention is to permit a function checker to be connected to a control unit of a vehicle to provide the control unit with new self-diagnosis functions without extensive modifications to the hardware. *See* Published Application, at [0007]. This is accomplished by connecting the function checker to existing communication lines between the control unit and various devices, and then sending a predetermined control signal through those pre-existing communication lines which causes the control unit to establish a self-diagnosis mode. *Id.* at [0008].

As set forth in Claim 12, the control unit contains two types of switches: (1) switches that require verification that a signal can be received by the control unit from the switches (ignition, engine starter and key interlock for locking the shift lever into park); and (2) switches that do not require verification that a signal can be received by the control unit from the switches (door switch). *See* Published Application, at [0023]. The function checker is connected so as to intercept the communication line for one of the first type of switches (requiring verification), and is also connected so as to intercept the communication line for one of the second type of switches (not requiring verification). *See Id.* at [0024]. When the function checker receives a signal from the first type of switch (for example, the ignition switch has been turned on), the function checker then sends a pseudo signal (for example, an on/off signal 10 times each second) to the control unit through the second type of switch (for example, the door switch) which causes the control unit to establish a self-diagnosis mode (because the door switch would not normally actuate 10 times per second) in which it can self-diagnose reception of signals from the first type of switches (those requiring verification). *See Id.* at [0024] to [0027].

The Examiner rejected the previously pending claims under 35 U.S.C. § 112 based on the phrase “configured to self-diagnose verification of reception of signals” because the Examiner asserted that the drawings and specification fail to teach how to verify or diagnose the reception of

signals. The pending claims have a similar limitation “a self-diagnosis mode in which self-diagnosis verification of reception of signals from the first plurality of switches is achieved.” Applicant respectfully submits that one skilled in the art would understand how to verify the reception of signals from the various switches to be tested by the control unit. *See* Abe reference, col. 3, lines 15-35. Moreover, the specification at page 7, line 7 to page 9, line 5 discloses how this function is accomplished.

Applicant has amended the claims to address the remaining objections based on 35 U.S.C. § 112. Applicant has re-written the independent claims to address any confusion with respect to Claim 11. Applicant has also written claim 12 to make sure that the goal of the preamble is set forth in the body of the claim by stating that “self-diagnosis verification of reception of signals from a plurality of switches is achieved.”

The features of claims 12 through 18 are neither disclosed nor suggested by U.S. Patent No. 5,050,080 to Abe on which the Examiner rejected the previously pending claims. In the presently claimed invention, the interconnection between the functionality checker and the control unit occurs, in part, through existing communication lines between the control unit and various switches. Furthermore, the claimed invention uses a pseudo signal (a signal that would not occur during normal operation) through the existing communication line (which can also carry a signal during normal operation of the system) to cause the control unit to enter into the self-diagnostic mode.

In contrast, the Abe reference does not address the problem set forth and solved in the instant application, which is to provide a way to implement a new diagnostic function without requiring changes in hardware and interconnections. *See* Published Application, at [00006]. Instead, the Abe reference discloses that portable diagnostic device 25 is connected to electronic control unit 2 through connectors 24 and 26, and the harness 27. *See* Abe, at col. 3, lines 62-66. The switches of Abe (e.g., 12, 14, 16) are connected to input interface 6, which only receives incoming signals. Any signal from the switches as well as diagnostic device 25 are received by input interface 6 and then are sent through bus 8 to their destination, which is necessarily either through or controlled by CPU

3. In other words, the signal from diagnostic device 25 is not input through the communication line from one of the various switches to the CPU but rather through the use of addressing in a bus communication system. In Abe, the diagnostic process begins after the diagnostic device is initialized through a demand signal sent to the electronic control unit 2 from the diagnostic device 25. *Id.*, at col. 4, lines 11-23. Thereafter, programs stored in ROM are executed, and a mode code must be input through keyboard 32 to set the diagnostic mode. *Id.*, at col. 4, lines 24-38. The diagnostic mode is not triggered by inserting a pseudo signal directly into the input from one of the switches to the CPU. Thus, the Abe reference does not disclose interconnecting with and using existing communication lines between the control unit and various switches to cause the control unit to enter a self-diagnostic mode in combination with the use of a pseudo signal (that is, a signal that a switch or other device would not normally send to the control unit) to cause the control unit to enter into the self-diagnostic mode, as set forth in claims 12 through 18. As such, the pending claims are patentable over Abe.

Applicant has addressed all concerns raised in the Examiner's April 19, 2007 Office Action and respectfully submits that new claims 12 through 18 are distinctly set forth, enabling and distinguish over the cited prior art.

CONCLUSION

In view of the foregoing amendments and remarks, applicant believes the pending application is in condition for allowance and earnestly solicits same.

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Respectfully submitted,

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